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Electronic Supplementary Information

All–inorganic $CsPbBr_3$ perovskite quantum dots as photoluminescent probe for ultrasensitive Cu^{2+} detection

Yongfeng Liu,[a] Xiaosheng Tang,[a] Tao Zhu,*[a] Ming Deng,[a] Iroegbu Paul Ikechukwu,[b] Wei Huang,[a] Guolu Yin,[a] Yongzhong Bai,[c] Dingrong Qu,[c] Xianbin Huang[c] and Feng Qiu[c]

[a] Key Laboratory of Optoelectronic Technology & Systems of the Education Ministry of China, College of Optoelectronic Engineering, Chongqing University, Chongqing 400044, China

[b] Information and Communications Engineering from the Key Laboratory of Optoelectronic Technology and Systems, Ministry of Education, Chongqing University, Chongqing, China

[c] State Key Laboratory of Safety and Control for Chemicals, SINOPEC Research Institute of Safety Engineering, Qingdao 266000,

*Corresponding author, E-mail: zhutao@cqu.edu.cn.

Supporting Figures and Tables

Table S1 Absorption peak, PL peak, Stokes shift, FWHM, and PL QY of $CsPbBr_3$ perovskites.

QDs	Abs peak (nm)/E1 (eV)	PL peak (nm)/E2 (eV)	Stokes shift (nm)	Stokes shift (meV)	FWHM (nm)	QY (%)
$CsPbBr_3$	508.11/2.44	518.05/2.39	9.94	50	16	90.12

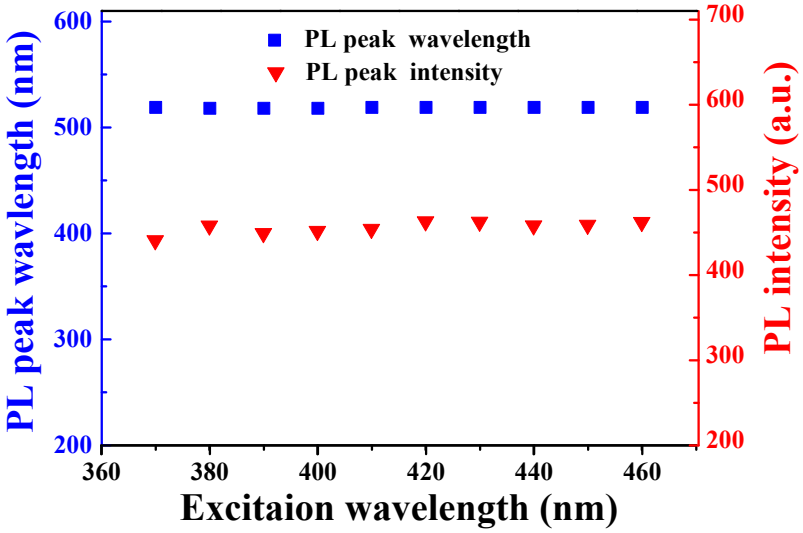

Figure S1 PL peak wavelength and intensity dependence of $CsPbBr_3$ on the excitation wavelength.

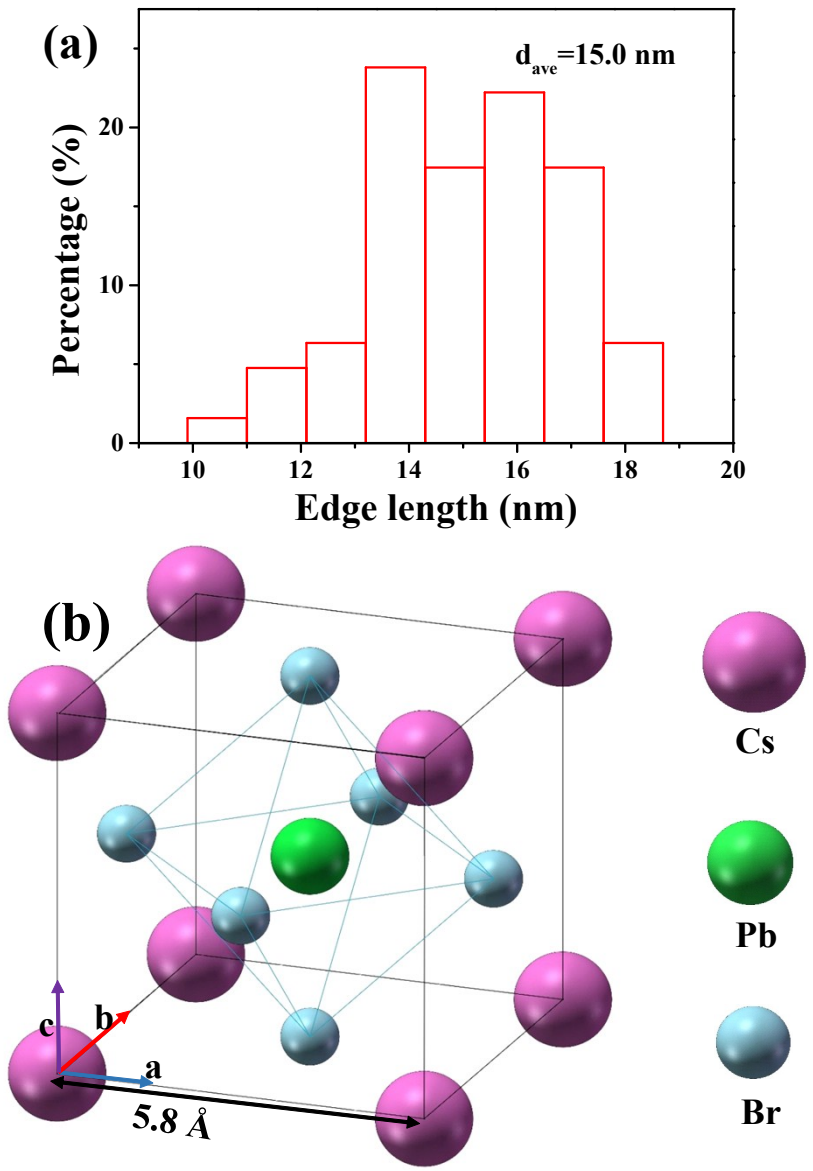

Figure S2 (a) Size distribution and (b) the typical cubic crystal structure diagram of $CsPbBr_3$.

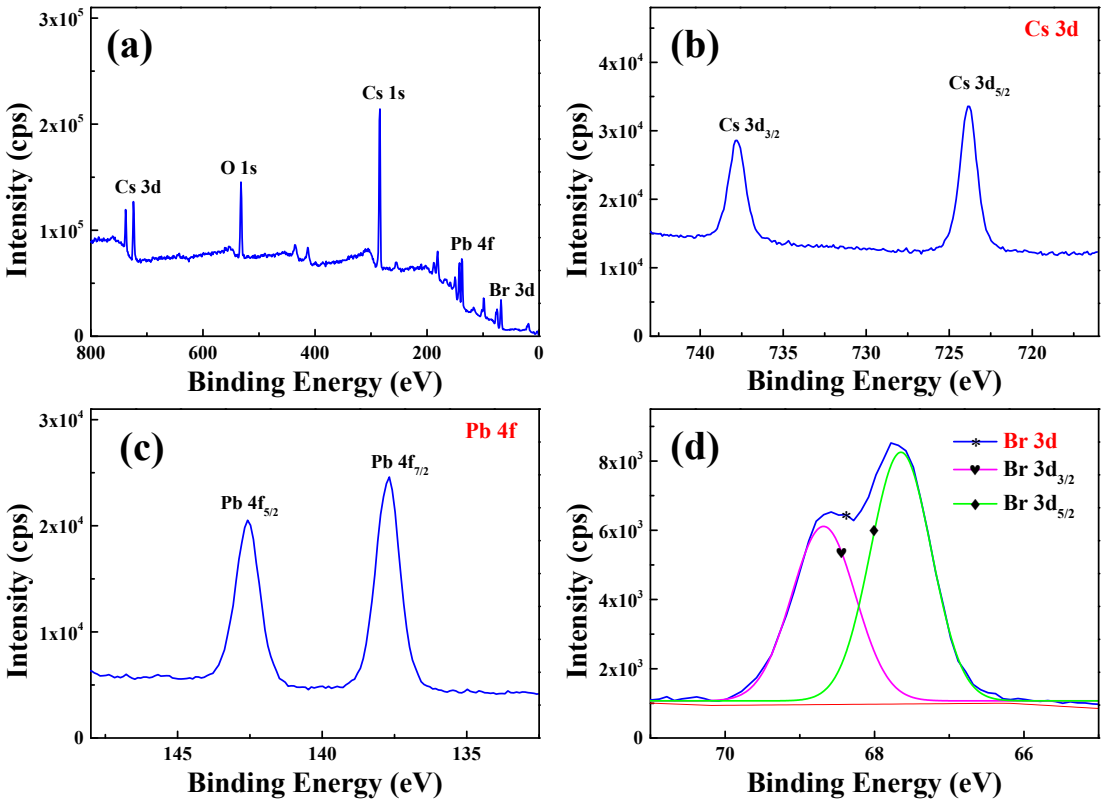

Figure S3 XPS spectra of CsPbBr3 PQDs. (a) Survey XPS and high-resolution XPS of (b) Cs 3d, (c) Pb 4f, and (d) Br 3d.

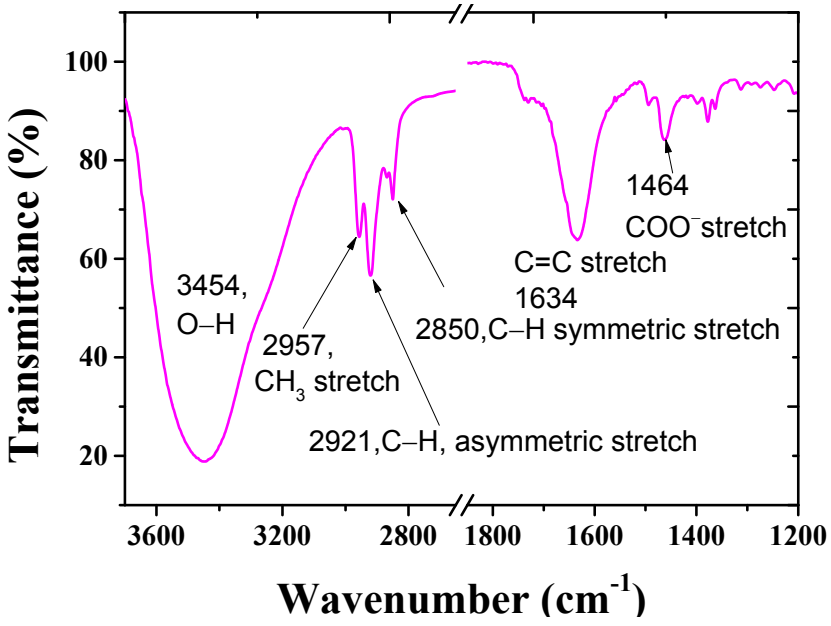

Figure S4 FTIR spectrum of $CsPbBr_3$ QDs.

Table S2 Fitting parameters of fluorescence decay curves.

Parameters / QDs	τ_1 (ns)	τ_2 (ns)	τ_3 (ns)	A_1 (%)	A_2 (%)	A_3 (%)	τ_{ave} (ns)	χ^2
CPB QDs in 0 nM Cu^{2+}	**4.54**	**20.24**	**99.77**	**19.48**	**46.65**	**33.87**	**80.84**	**1.233**
CPB QDs in 50 nM Cu^{2+}	**3.95**	**17.36**	**88.28**	**19.52**	**46.63**	**33.85**	**71.83**	**1.161**
CPB QDs in 100 nM Cu^{2+}	**3.48**	**15.64**	**78.39**	**23.53**	**48.15**	**28.31**	**60.92**	**1.193**

Table S3 Average lifetime of the CPB NCs in the presence of metal ions.

Metal ions	**no**	**In^{3+}**	**Ag^{+}**	**Cd^{2+}**	**Fe^{3+}**	**Hg^{2+}**	**Mg^{2+}**	**Mn^{2+}**	**Na^{+}**	**Pb^{2+}**	**Zn^{2+}**	**Ni^{2+}**	**Cu^{2+}**
τ_{av} (ns)	**80.84**	**78.01**	**80.82**	**77.44**	**80.03**	**80.44**	**78.33**	**75.67**	**78.01**	**78.90**	**80.51**	**80.03**	**60.92**